INDIANA Epidemiology NEWSLETTER

Indiana State Department of Health

Epidemiology Resource Center
2 North Meridian Street, 3-D
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New Staff Members Join
ISDH Epidemiology Resource Center

Twelve new epidemiologists and two support staff have recently joined the Indiana State Department of Health Epidemiology Resource Center (ERC) in an effort to meet the critical benchmarks outlined in the Cooperative Agreement on Public Health Preparedness and Response for Bioterrorism.

Eight of the epidemiologists will serve as field epidemiologists in the bioterrorism preparedness districts throughout Indiana (see map). These new employees will help local health departments detect disease natural disease outbreaks or those occurring from a bioterrorist event. Working closely with local health departments, hospitals and health care providers, the field epidemiologists can also greatly decrease response time during a public health crisis. The field epidemiologists will also assist local health departments with maintaining supplies to conduct investigations, coordinate training, and conduct routine infectious disease surveillance. Having epidemiologists in the field will also allow epidemiologists in Indianapolis to develop expertise for identifying subtle indicators of communicable diseases and to track long-term trends.

Donna Allen, a former field representative for the ISDH Immunization Program, will be stationed in Porter County in District 1. **Brad Beard**, a former field representative for the ISDH Food Protection Program, will be stationed in Allen County in District 3. **Sandy Gorsuch**, a former public health administrator for the ISDH HIV/STD Program, will be located in Tippecanoe County in District 4. **Lora Bogda**, who recently received a Master's of Public Health degree with an epidemiology concentration, will be located at ISDH in District 5. **Stephanie Jackson**, who will join the ISDH ERC on June 23, will be stationed at Delaware County in District 6. **Robert Allen**, a former immunization representative with the Marion County Health Department, will be located in either Vigo or Sullivan County and will cover Districts 7 and 10. **Steve Allen**, a former field representative for the ISDH Immunization Program, will be located in Bartholomew County in District 8. **Karen Gordon**, a former field representative for the ISDH Immunization Program, will be located in Warrick County and will cover District 9. The position located in Elkhart County and covering District 2 remains vacant.

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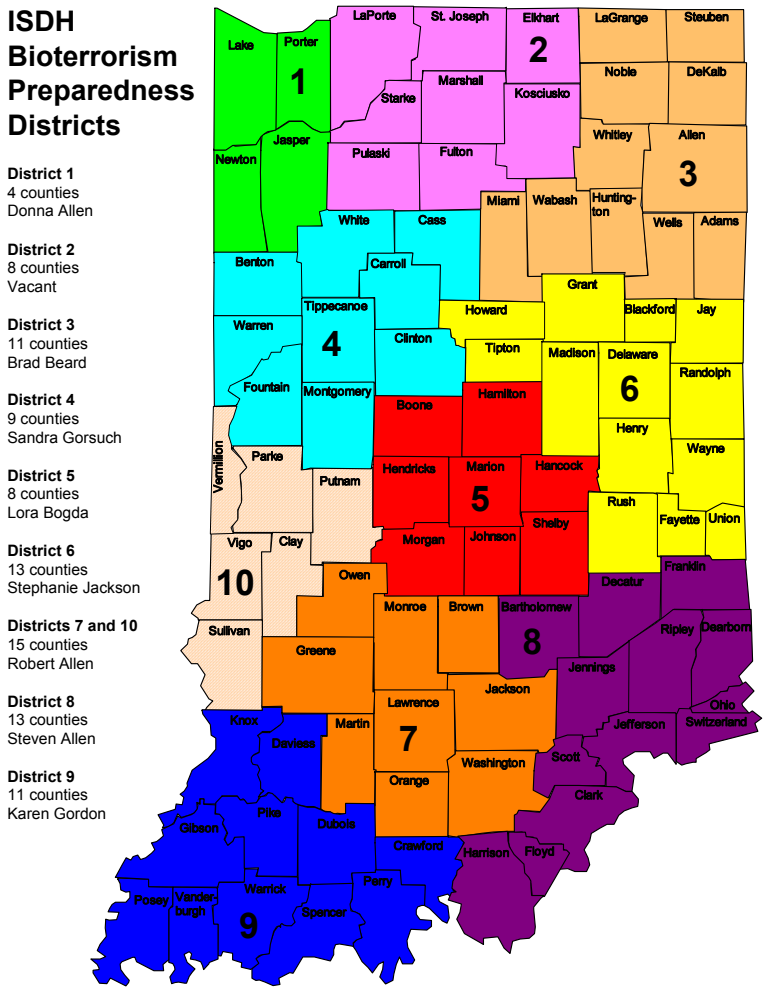
Prior to going out to the districts, the field epidemiologists completed six full days of training, including information on various infectious disease agents, surveillance and disease reporting, outbreak investigations, laboratory testing and result interpretation, risk communication and media interviews, HIPAA, and global public health issues. Currently the field epidemiologists are making introductory visits to the local health departments within their districts. They will also be assisting local health departments to determine needs and priorities for allocation of federal grant funding recently made available.

In addition to the field epidemiologists, four other epidemiologists have joined the ISDH ERC in Indianapolis. **Shawn Richards**, a former ISDH public health investigator, was promoted as the new respiratory epidemiologist. Her responsibilities include influenza sentinel surveillance and investigation of respiratory diseases, including SARS. **Linda Jones**, formerly an infection control specialist with Clarion Health in Indianapolis, joins ISDH as the new syndromic surveillance epidemiologist. Her main responsibility will be developing and monitoring a system for tracking indicators that could suggest an outbreak, such as emergency room visits, ambulance runs, and over-the-counter drug sales, before a disease is actually diagnosed. **Dr. Mokbul Khan** joins ISDH as the new biostatistician, whose duties include advanced statistical analysis of public health data. **James Michael** will analyze the timeliness, accuracy and completeness of public health data as the new quality assurance epidemiologist.

Two new support staff will provide much needed assistance. **Trish Manuel** is the new supervisor of the support section, and **Nina Smith**, data processing operator, will manage collection and computerization of investigation and surveillance data.



Assessing Human Exposures

LaNetta Alexander
ISDH Epidemiology Resource Center

Do you live near a landfill, hazardous waste facility, gas station, or other business that may involve the release of hazardous chemicals? Have you ever wondered if perhaps you could be exposed to the chemicals present on that site?

The process of public health assessment (PHA) assists in evaluating whether people are or may be exposed to chemicals released to the environment and also determines whether those exposures result in illness or adverse health effects.

The PHA process is somewhat complex, involving the knowledge of exposure pathways, toxicological information, health outcome data and community concerns. An exposure pathway basically describes how people come in contact with a chemical. There are five major elements to consider when determining exposure pathways:

1) point of exposure (where people come in contact with the chemical);
2) source of exposure (e.g., smokestack, leaking drums, landfills);
3) environmental medium (water, soil, air, etc.);
4) exposed population; and
5) the route of exposure.

Exposure to chemicals generally occurs through three major routes:

1) inhalation,
2) dermal (skin) exposure,
3) or ingestion.

Periods of exposure (length of time) are also considered. Fifteen days or less is generally known as **acute** exposure. From 15 to 364 days is **intermediate** exposure and 365 days or more is **chronic** exposure. The toxic (poisonous) properties of a chemical along with length of exposure time will determine potential adverse health effects from chemical exposures.

A key factor in the assessment process is the site visit. The health assessor can identify pathways by review of current site conditions, gathering site background information and history, establishing relationships with community members through collection of first hand information and the gathering of environmental data (i.e., sampling).

NOTICE:

Hard Copies of Epidemiology Newsletter No Longer Available After This Issue

To reduce printing expenses, mailing costs, and staff time, the *Indiana Epidemiology Newsletter* will no longer be available in hard copy after this issue. To receive the newsletter by e-mail, please call Cheryl Thomas at (317) 233-7406 or e-mail her at *cthomas@isdh.state.in.us*. A link to the ISDH newsletter index page (http://www.statehealth.IN.gov/dataandstats/epidem/epinews_index.htm) will be sent directly to the e-mail address provided at no cost for each new issue.

Here is an example scenario of a site that would undergo the PHA process. A new housing addition was built on a closed landfill. The landfill is producing gases that are moving from the landfill into the air. The residents in the addition are reporting foul odors. Collection of air samples from the area confirms that gases from the landfill are moving into the housing addition, but the report of the analyses performed does not contain information about any contaminant that might be the odor-causing chemical. The information shows that the residents are breathing gases that have moved from the landfill into their neighborhood, but the odor-causing chemical has not been identified.

While this example does demonstrate exposure, it is important to note that proximity to a site (living next door, across the street, within a mile, etc.) does not necessarily mean that someone is adversely affected by it. Many other factors, including the ones mentioned above must first be considered.

Another important issue to note is that everyone is exposed to toxic chemicals around the home. Products such as detergents, household cleaning agents (such as ammonia and bleach), rodent and insect killers, etc. are among the most common. Other home exposures, such as aromatic hydrocarbons in wood smoke and nicotine alkaloids in tobacco smoke are not always immediately obvious.

Much more detailed information on the health assessment process is available for the general public through the Agency for Toxic Substances and Disease Registry (ATSDR) website http://www.atsdr.cdc.gov/training/public-health-assessment-overview/, an interactive learning program. Locally, the Environmental Epidemiology Section of the Epidemiology Resource Center at the ISDH can be called toll free at (800) 382-9480.

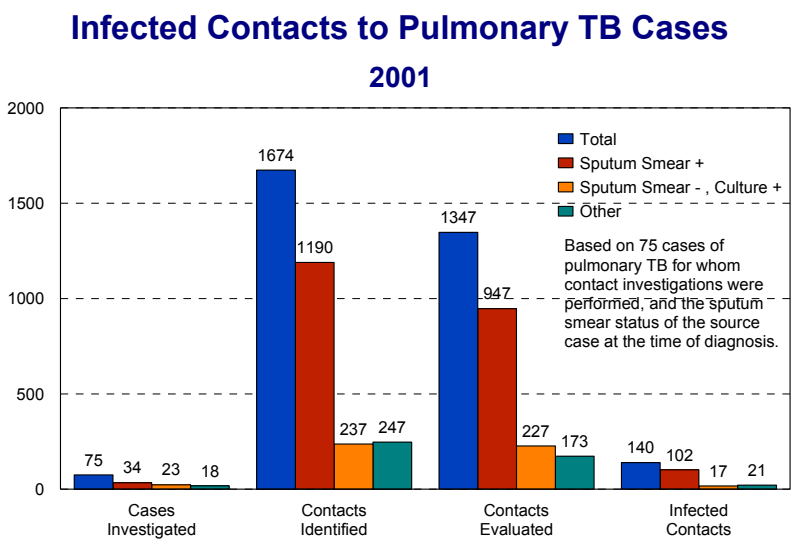
Infectiousness of Tuberculosis

Paul Britton, R.N., M.S.
ISDH TB Control Program

Tuberculosis (TB) is a communicable disease caused by the bacterium *Mycobacterium tuberculosis*, also known historically as the tubercle bacillus. *M. tuberculosis* is one of five species which constitute the *M. tuberculosis*, or MTB complex. The others are *M. bovis*, *M. africanum*, *M. canettii*, and *M. microti*. Infection is transmitted when tubercle bacilli are expelled into the air when someone with TB disease in the lung or elsewhere in the airway coughs, sneezes, or performs some other forceful expiratory action. The bacilli are attached to droplet nuclei, which are the dried residue of the expired respiratory secretions. Particles 1-5 microns in diameter can remain airborne for several hours. The larger particles fall to the surface. Transmission may occur if another person inhales these droplet nuclei.

Unlike other airborne diseases that are highly infectious, such as measles, TB is relatively difficult to transmit and generally requires close, prolonged contact over long periods of time. With extremely rare exceptions, only persons with active disease in the lung or larynx can transmit the disease to others. Transmission involving contact with extrapulmonary TB has been limited to such instances as penetrating injures among laboratory and autopsy personnel, and inhalation of aerosols created by surgical wound irrigation devices. Figure 1 shows the breakdown of Indiana TB cases by site of disease in 2001.

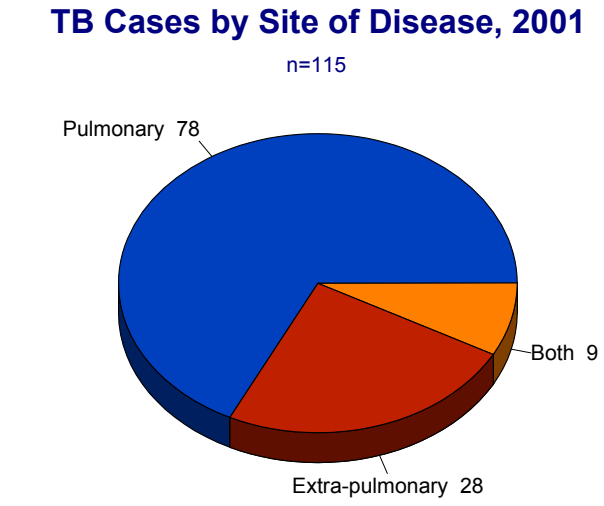
Figure 1.



Source: Indiana State Department of Health TB Control Program

Not all patients with pulmonary disease are infectious at the time of diagnosis, and relatively few contacts actually become infected (figure 2), although the number of infected contacts per case is highly variable.

Figure 2.



Source: Indiana State Department of Health TB Control Program

Like other communicable diseases, the probability of TB transmission depends on several factors:

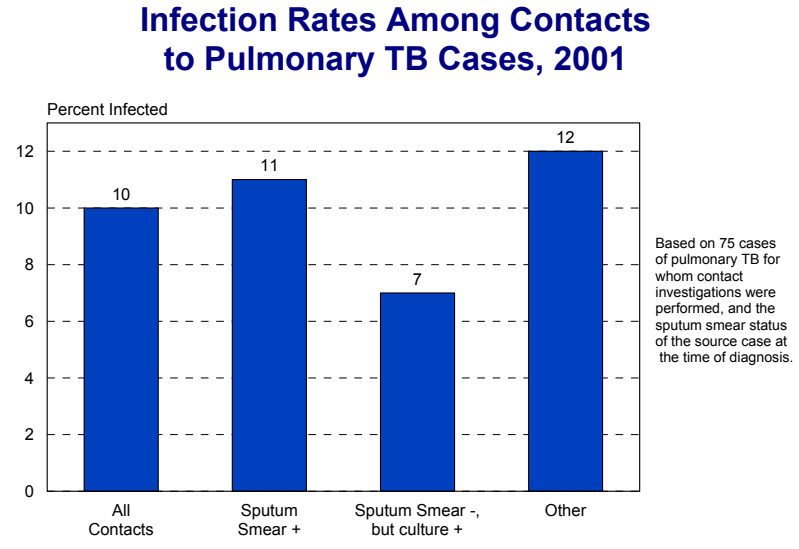
1) the infectiousness of the person with TB. It has long been known that the untreated patient with acid-fast bacilli (AFB) in the sputum and extensive cavitary disease is most likely to transmit TB to others. The frequency of coughing also plays an important role. The absence of AFB in the sputum decreases, but does not eliminate, the level of infectiousness.

2) the environment in which the exposure occurred. TB transmission favors enclosed, poorly ventilated spaces. This is why TB is transmitted mostly in household and many types of social settings, such as bars, pool halls, and abandoned houses frequented by the homeless.

3) the frequency and duration of the exposure. It has been estimated that, on average, it takes the equivalent of 8 hours of exposure per day for a person to have a 50 percent chance of becoming infected. This is in sharp contrast to a child with measles or chickenpox infecting the majority of non-immune close contacts after only a few hours of exposure. Instances where persons are infected with TB after brief, less-than-close contact are uncommon, but do occur.

It has been estimated that infectious TB patients infect an average of 10 contacts prior to the initiation of chemotherapy. Infection rates can be difficult to quantify on a national level. Infection rates for contacts of pulmonary TB cases in Indiana during 2001 are shown in figure 3. This is the most recent year with complete contact investigation data. The rates are broken down according to the sputum AFB smear and culture status of the source case: sputum smear positive, regardless of culture results, sputum smear negative but culture positive, and "other." The "other" category includes contacts to source cases for whom sputum was not collected, or who had positive cultures only from respiratory specimens other than sputum. Many patients in the last category were found to be sputum smear positive after their initial medical evaluation, and would have certainly been sputum smear positive at the time of diagnosis had pre-treatment sputum specimens been collected.

Figure 3.



Source: Indiana State Department of Health TB Control Program

The most effective control measures for TB transmission are to isolate the TB patient, immediately begin effective anti-TB chemotherapy, and instruct the patient to cover his or her mouth and nose when coughing or sneezing. Infectiousness usually declines rapidly once treatment is started, as long as the patient adheres to the treatment regimen. However, persons with multi-drug resistant TB are often infectious for longer periods, and thereby have the potential to transmit TB more people.

There is no "specific time frame" for how long TB patients need to be on medication before they are no longer infectious. Although the traditional time of two weeks of therapy has been considered adequate to render a patient sufficiently non-infectious in the past, the evidence is, at best, circumstantial. For patients whose pre-treatment sputum is negative for AFB, two weeks of treatment is probably sufficient. That is probably not always the case for patients whose sputum is smear-positive. The truth is that no one knows precisely when patients are no longer infectious. The current guidelines established by the American Thoracic Society and adopted by the Indiana State Department of Health state that patients are considered to be no longer infectious when all of the following criteria are met:

- They are on an adequate treatment regimen
- They have had a significant clinical response to therapy, particularly resolution of coughing, and
- They have had 3 consecutive negative sputum smear results from specimens collected 8-24 hours apart

When the word "tuberculosis" is mentioned, people immediately think of active TB disease and the images of very ill people with a chronic, persistent cough who spread this terrible disease to others. Awareness was heightened as a result of well-documented outbreaks in the 1980s and early 1990s. People asking, "Am I going to catch TB?", were given a complicated and incomplete answer because most of the understanding about the infectiousness of TB is the result of observations of natural occurrences and accidents rather than intentional scientific study. The use of other molecular laboratory techniques will hopefully give a better understanding of the principles of TB transmission.

References:

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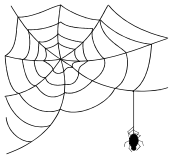
3. Friedman, Lloyd N. *Tuberculosis: Current Concepts and Treatment*. Boca Raton: CRC Press. 1994.

4. Reichman, Lee B., and Hershfield, Earl S., Ed.: *Tuberculosis: A Comprehensive International Approach, Second Edition*. New York: Marcel Dekker, Inc. 2000.



Wonderful Wide Web Sites

ISDH Data Reports Available

The ISDH Epidemiology Resource Center has the following data reports and the Indiana Epidemiology Newsletter available on the ISDH Web Page:

http://www.in.gov/isdh/dataandstats/epidem/epinews_index.htm

Indiana Cancer Incidence Report (1990, 95,96, 97)

Indiana Cancer Mortality Report (1990-94, 1992-96)

Indiana Health Behavior Risk Factors (1995-96, 97, 98, 99, 2000, 2001)

Indiana Hospital Consumer Guide (1996)

Public, Hospital Discharge Data (1999, 2000, 2001)

Indiana Maternal & Child Health Outcomes & Performance Measures (1988-97, 1989-98, 1990-99, 1991-2000)

Indiana Marriage Report (1995, 97, 98, 99, 2000)

Indiana Mortality Report (1999, 2000, 2001)

Indiana Natality Report (1998, 99, 2000, 2001)

Indiana Induced Termination of Pregnancy Report (1998, 99, 2000)

Indiana Infectious Diseases Report (2000)

Former Indiana Report of Diseases of Public Health Interest (1996, 97, 98, 99)

HIV Disease Summary

Information as of April 30, 2003 (based on 2000 population of 6,080,485)

HIV - without AIDS to date:

404	New HIV cases from May 2002 thru April 2003	12-month incidence	6.64 cases/100,000
3,725	Total HIV-positive, alive and without AIDS on April 30, 2003	Point prevalence	61.27 cases/100,000

AIDS cases to date:

512	New AIDS cases from May 2002 thru April 2003	12-month incidence	8.42 cases/100,000
3,371	Total AIDS cases, alive on April 30, 2003	Point prevalence	55.44 cases/100,000
7,105	Total AIDS cases, cumulative (alive and dead)		

REPORTED CASES of selected notifiable diseases

Disease	Cases Reported in April *MMWR* Week 14-18		Cumulative Cases Reported January - April *MMWR* Weeks 1-18	
	2002	2003	2002	2003
Campylobacteriosis	39	25	79	68
Chlamydia	2,961	2,370	5,752	5,315
E. coli O157:H7	2	4	9	10
Hepatitis A	9	1	20	11
Hepatitis B	3	6	9	10
Invasive Drug Resistant *S. pneumoniae* (DRSP)	19	28	72	70
Gonorrhea	1,231	918	2,503	2,090
Legionellosis	1	0	2	2
Lyme Disease	0	1	2	4
Measles	0	0	0	0
Meningococcal, invasive	5	4	16	17
Pertussis	1	13	15	20
Rocky Mountain Spotted Fever	0	0	0	0
Salmonellosis	52	54	103	109
Shigellosis	9	12	22	37
Syphilis (Primary and Secondary)	13	10	23	15
Tuberculosis	8	8	22	30
Animal Rabies	2 (bats)	0	3 (bats)	2 (bats)

For information on reporting of communicable diseases in Indiana, call the *ISDH Communicable Disease Division* at (317) 233-7665.

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The *Indiana Epidemiology Newsletter* is published by the Indiana State Department of Health to provide epidemiologic information to Indiana health professionals and to the public health community.